H. A. CARHART.

TYPE WRITING MACHINE.

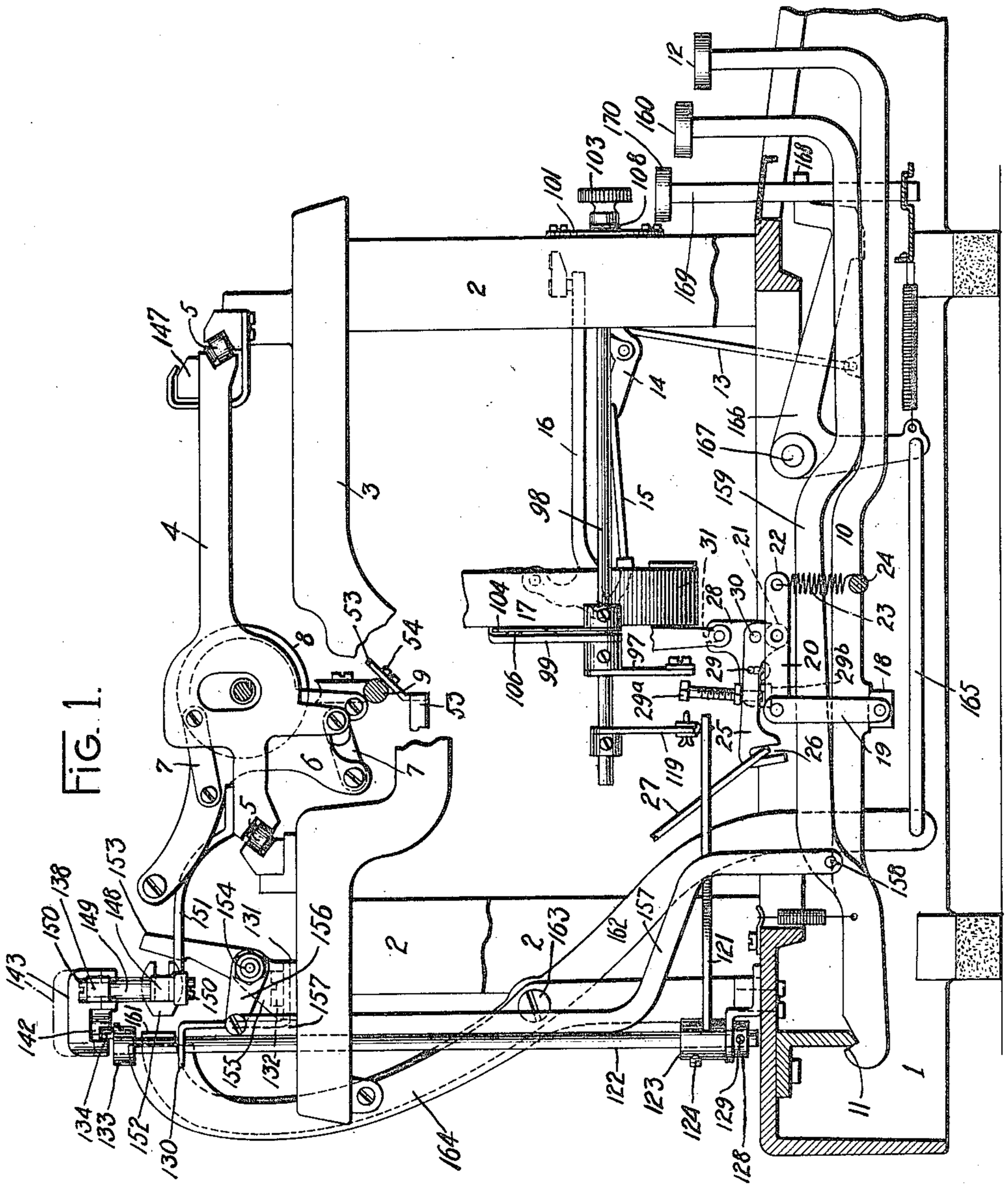
APPLICATION FILED OCT. 18, 1917.

1,271,663.

Patented July 9, 1918.

3 SHEETS—SHEET 1.

FIG. 1.



WITNESSES

L. Nelson.

Charles E. Smith

INVENTOR

Herbert A. Carhart

By Jacob Felbel

HIS ATTORNEY

H. A. CARHART.

TYPE WRITING MACHINE.

APPLICATION FILED OCT. 18, 1917.

1,271,663.

Patented July 9, 1918.

3 SHEETS—SHEET 2.

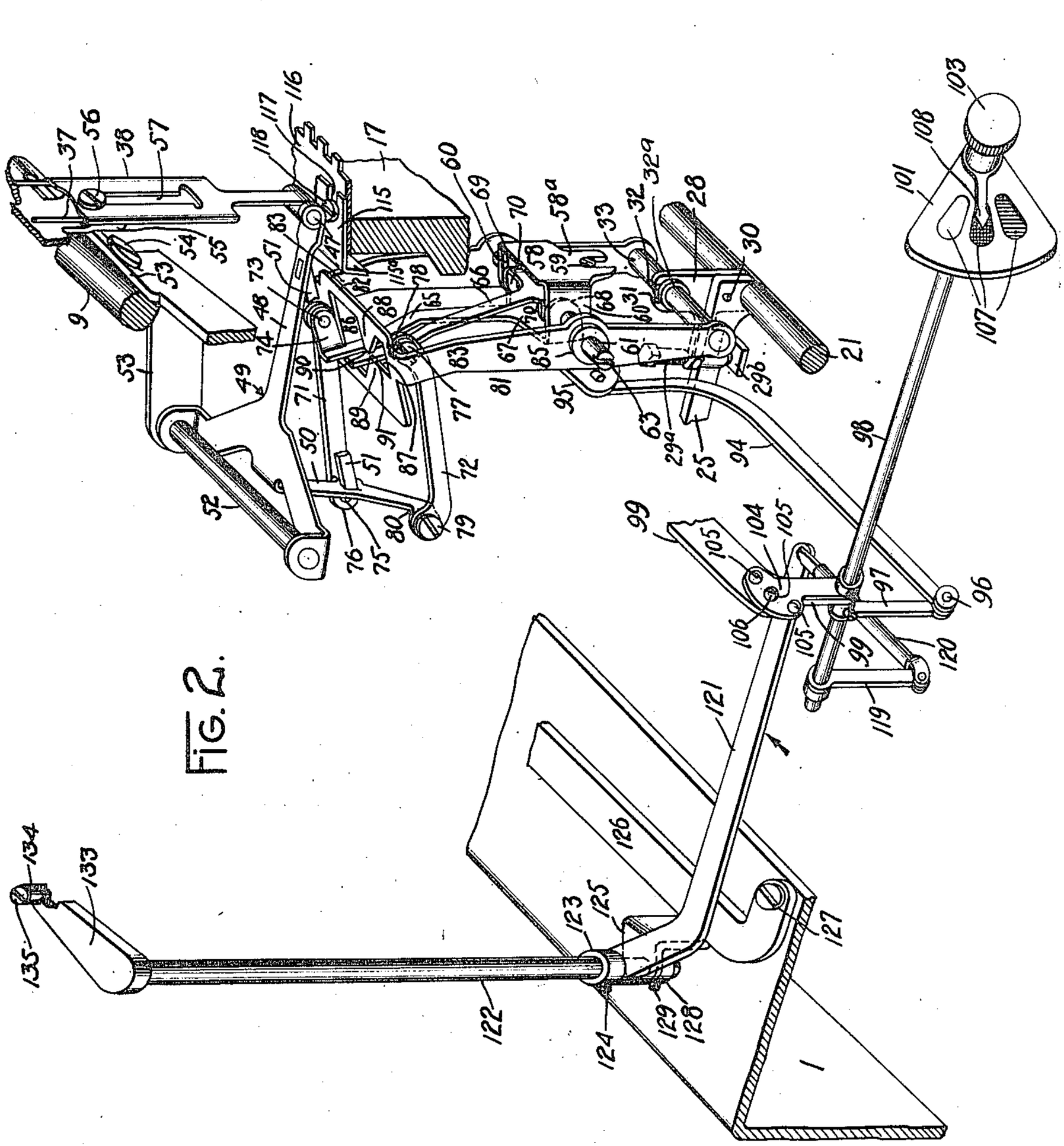


FIG. 2.

WITNESSES

L. Nelson

Walter E. Smith

INVENTOR

Herbert A. Carhart

By Jacob Felbel

HIS ATTORNEY

H. A. CARHART.

TYPE WRITING MACHINE.

APPLICATION FILED OCT. 18, 1917.

1,271,663.

Patented July 9, 1918.

3 SHEETS—SHEET 3.

FIG. 7.

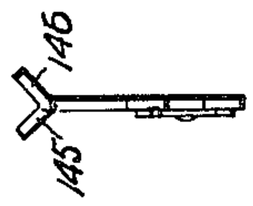


FIG. 6.

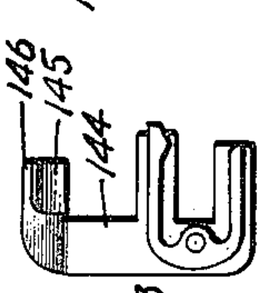


FIG. 3.

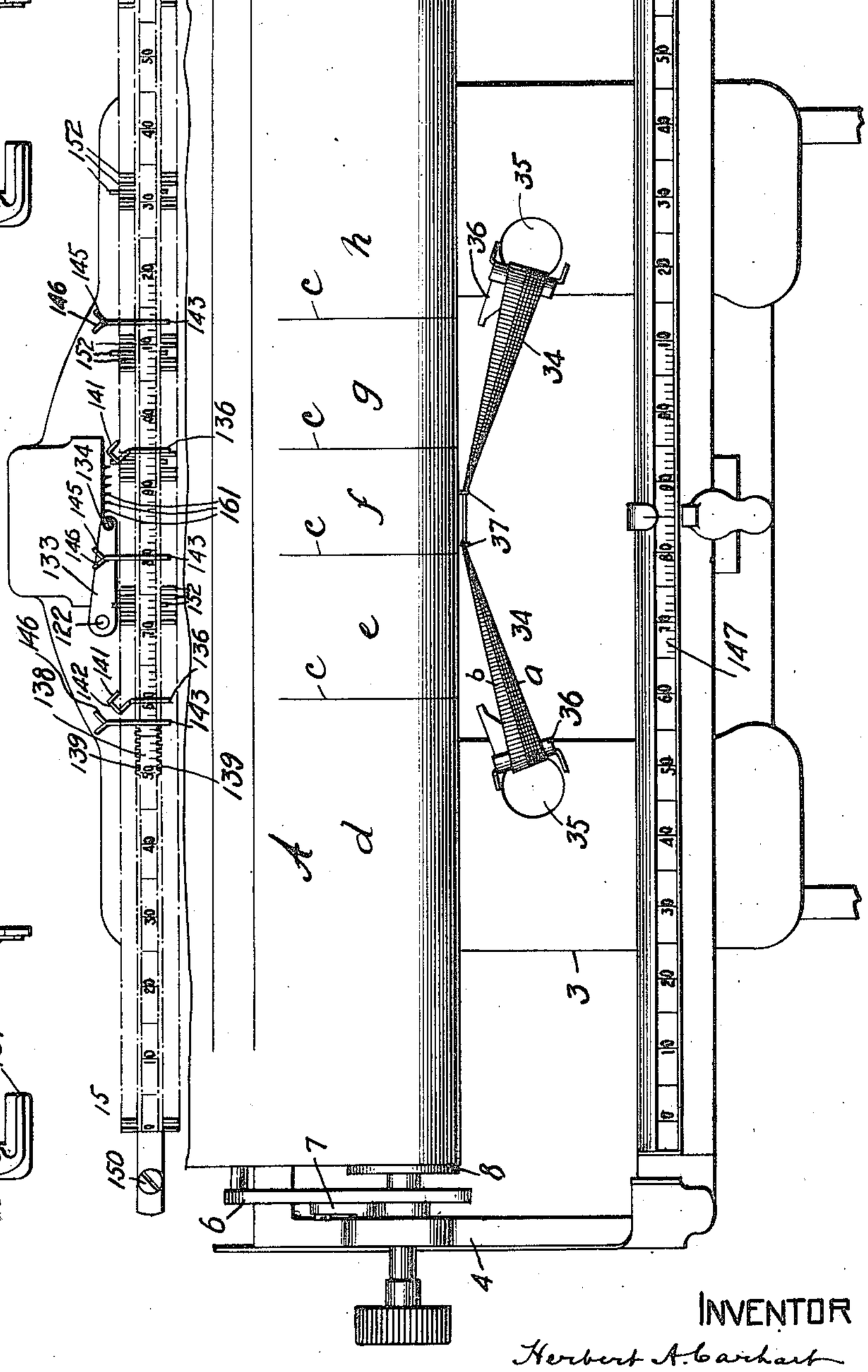


FIG. 5.

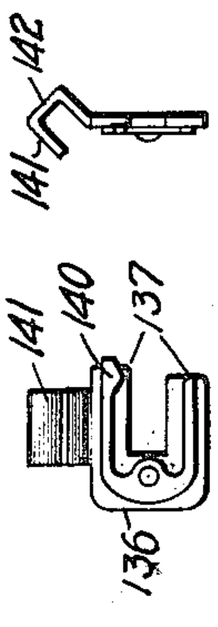


FIG. 4.

WITNESSES

L. Nelson.

Wilkes & Smith

INVENTOR

Herbert A. Carhart

By Jacob Felbel

HIS ATTORNEY.

UNITED STATES PATENT OFFICE.

HERBERT A. CARHART, OF SYRACUSE, NEW YORK, ASSIGNOR TO REMINGTON TYPE-WRITER COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,271,663. Specification of Letters Patent. Patented July 9, 1918.

Application filed October 18, 1917. Serial No. 197,214.

To all whom it may concern:

Be it known that I, HERBERT A. CARHART, citizen of the United States, and resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines, and more particularly to means for automatically bringing one or another of two different color fields of a ribbon into use at a predetermined point or points in the travel of the carriage.

One of the main objects of my invention, generally stated, is to provide improved and efficient means of the character specified.

A further object of the invention is to provide simple and efficient devices that may be readily embodied in existing machines on the market and operate in conjunction therewith to effect the purposes stated above without modifying the structural features of said machine as they now exist, other than by the addition of my devices to operate in combination therewith.

Generally stated, my invention is intended to accomplish the same general ends that are attained by the constructions disclosed in the Patents Nos. 878,163; 878,573; 878,574; and 880,591, granted to Herbert H. Steele, and on which the present invention may be regarded as an improvement.

The invention in the present instance is embodied in a No. 11 Remington machine equipped with the usual key set denominational tabulator, and in which the invention may be readily incorporated without modifying the structural features of said machine. It should be understood, however that from certain aspects of my invention it may be embodied in various styles of machines, and that various changes may be made in effecting such embodiment.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangements of parts and combinations of devices set forth in the following description and particularly pointed out in the appended claims.

In the drawings wherein like reference characters indicate corresponding parts in the different views,

Figure 1 is a fragmentary side elevation, partly in section, of one form of typewriting machine embodying my invention, only so much of the machine being shown as may be necessary to arrive at an understanding of my invention.

Fig. 2 is a detail fragmentary perspective view of the ribbon controlling mechanism and some of the associated parts.

Fig. 3 is a fragmentary top plan view of the machine with parts omitted.

Figs. 4 and 5 are respectively detail side and bottom edge views of one of the controlling devices or cams.

Figs. 6 and 7 are respectively detail side and bottom edge views of another and different form of controlling device or cam.

The polychrome mechanism disclosed in the accompanying drawings, aside from the means for automatically shifting it during the travel of the carriage, is the same as that embodied in the No. 11 Remington machine. Such mechanism is shown and described in the patent granted to John H. Barr, September 14, 1915, No. 1,153,668.

The frame of the machine comprises a base 1, corner posts 2 and a top plate 3. A power driven carriage, designated as a whole by the reference numeral 4, is mounted on anti-friction rollers 5 to move from side to side of the machine over the top plate. A platen frame 6 is connected with the carriage by a link 7 and carries a cylindrical platen 8 which is supported in the usual manner by a shift rail 9 controlled by the ordinary case shift means, not shown, to effect a case shift movement of the platen frame and platen on the carriage.

Each of the printing key levers 10 is fulcrumed at 11 in the base of the machine and is provided with a finger key 12. A link 13 connects each key lever 10 with a sub-lever 14, a link 15 forming a connection between each sub-lever and its type bar 16. The type bars are segmentally arranged and pivoted on a segment or support 17 to swing upwardly and rearwardly to strike against the front face of the platen 8.

A universal bar 18 extends beneath the various printing key levers 10 and is connected at its ends to depending links 19 pivoted at their upper ends to crank arms 20 which project rearwardly from a rock shaft 21 mounted to turn on pivot screws in the base of the machine. A forwardly projecting crank arm 22 on the rock shaft is con-

nected to one end of a contractile returning spring 23, the opposite end of said spring being connected to a pin 24 which projects from the base of the machine. A centrally disposed crank arm 25 is fixed to the rock shaft 21 and extends rearwardly therefrom. This arm is slotted at 26 to receive a cross pin on a link 27 connected in the usual manner to the carriage escapement, not shown. An arm 28 which is in the nature of a sheet metal plate is adjustably secured to the arm 25 by a set screw 29 and a pivot screw 30, the adjustment of the arm being around the pivot screw 30 as a center. The plate is slotted to receive the stem of a screw 29, whereas the head thereof bears against the plate and holds it in its adjusted position relatively to the arm 25. A set screw 29^a is also provided to retain the plate 28 in the position to which it may be adjusted relatively to the arm 25. This set screw 29^a is received in a tapped opening in an off-set ear on the arm 25 and at its lower end engages an off-set shoe 29^b carried by the plate 28 and extending beneath the set screw. The upper end of the arm formed by the plate 28 is slotted at 31 where it is received in a peripheral groove 32 (see Fig. 2) in a sleeve or collar 32^a that is free to turn and slide on a cross pin 33 of the ribbon vibrator actuator mechanism to be hereinafter described. It will be understood, therefore, that each depression of a printing key is effective to rock the shaft 21, and thereby actuate the ribbon vibrator operating mechanism through the cross pin 33, and is also effective to actuate the escapement mechanism through the link 27.

A bi-color inking ribbon 34 may be assumed to be divided into two longitudinally extending color fields, a black upper field or stripe *a* and a red lower field or stripe *b*. This ribbon is carried and fed longitudinally by the usual ribbon spools and associated ribbon mechanism, not shown, and is led upward from the spools through openings 35 in the top plate, thence over stationary guides 36 and through guide openings in the head or upper portion of a ribbon carrier or vibrator comprising the usual parallel guide loops 37 rising from the body portion 38 of the vibrator.

Referring to Fig. 2, it will be seen that the lower end of the ribbon vibrator 37, 38 is pivotally connected at 47 to the centrally disposed arm 48 of a bell crank lever 49. This lever further comprises a downwardly extending angular arm 50 and a cross arm or brace 51 connects the two arms and stiffens the member as a whole. The arm 48 divides into two branches which terminate in ears that fit over a rod 52 and bear pivotally thereon, said rod providing a fulcrum for the bell crank. The rod 52 is mounted on a bracket 53 that is secured by screws 54 to the shift rail 9 and comprises a portion extending rearwardly below the shift rail and a forwardly and upwardly inclined portion which is provided with a tongue or lip 55 into which is threaded a headed shouldered screw 56. This screw serves as a guide for the ribbon vibrator, the sheet metal body portion 38 whereof is formed with a slot 57 which receives the screw and coöperates with the same to guide the vibrator when it is moved up and down during printing operations.

The devices for actuating the operating lever or member 49 are mounted on a bracket 58 which, as shown in Fig. 2, is detachably secured by screws 59 to the rear of the type bar support 17. Said bracket has a downward extension 58^a slotted to receive one of the screws 59. The slots in the bracket 58 which receive the screws 59 (only one of which is shown) are open at their lower ends so that by loosening the screws the bracket, together with the parts which it supports, may be vertically adjusted. Said bracket is provided with rearwardly bent parallel ears 60 which receive a rod 61 on which the actuating devices are pivotally mounted.

In the course of the assembling of the rod 61 on the bracket, the parts for which said rod provides a pivot are also assembled in place. These parts comprise two actuators or levers 65 and 66 which have a common pivot, being arranged to turn or fulcrum on the rod 61 between the ears 60. The lever or member 65 is provided near its lower end with a cross portion 67, which terminates in forwardly bent ears 68, while the lever 66 has a cross portion 69 terminating in rearwardly bent ears 70. The two sets of ears are perforated so that the rod 61 may pass through them. The cross portions 69 and 67 are of such length that the ears 70 are embraced loosely between the ears 68, while these latter ears are loosely confined between the ears 60 of the bracket 58. The lever 65 is constantly connected with the downwardly extending arm 50 of the operating bell crank by a link 71, while the lever 66 is constantly connected to the arm 50 by a link 72. The link 71 is above the link 72 and at its forward end is pivotally connected, as by a shouldered screw 73, with an ear 74 bent forward from the side of the lever 65 at its upper end. The rear end of the link 71 is pivotally connected by a shouldered screw 75 with an ear 76 bent rearward from the arm 50 about midway of its length. The link 72 is pivotally connected at its forward end by a shouldered screw 77 with the lever 66, said shouldered screw being threaded in an ear 78 and bent forward from the lever 66 somewhat below its upper end. The rear end of the link 72 is pivotally connected by a shouldered screw

79 with an ear 80 bent backward from the arm 50 at its lower end, said ear 80 being at the opposite side edge of said arm from the ear 76. The links 71 and 72 incline downwardly and rearwardly from their respective pivotal connections 73 and 77 so that they are at angles to a horizontal line passing through these pivots. Said pivots, during the platen shifting operation, remain stationary since the levers 65 and 66 are mounted on a stationary support. During the shift of the platen the rear ends of said links are moved upward, being carried by the operating lever 49 which is supported from the platen shifting frame. The links are so disposed that during the platen shifting operation they cross the horizontal or median lines and at the end of said operation are at the same angle to said lines but above them as normally they are below them. It will be observed that as a result of the platen shifting operation the ribbon vibrator operating lever 49 and the links 71 and 72 are moved or shifted, but the elements of the ribbon vibrator mechanism below said links are not affected by the shift. It will be seen that the pair of links 71 and 72 are at all times constantly connected to the parts linked together by the links, viz., the arm 50 and the respective levers or actuators 65 and 66. It will also be noted that the two key operated actuators or levers 65 and 66 are constantly connected independently of each other to the vibrator. While the actuators 65 and 66 are constantly connected with the operating lever 49, means are provided for rendering them separately or alternately effective at will to operate said lever, said means comprising a rocking frame or actuating lever member, designated as a whole by the reference numeral 81. The frame 81 is rectangular in shape and comprises a sheet metal portion bent into a U-shape and inverted, providing a cross member 82 and parallel side portions 83, the side portions being connected at their lower ends by the cross rod or pin 33 hereinbefore referred to. The side portions are perforated and reinforced with bosses or hubs 85 to fit over and bear both rotatably and slidably on the rod 61, being thus mounted co-axially with the actuators 65 and 66. The upper cross portion 82 of the frame is rectangular in shape. This rectangular part is cut out, providing an opening or slot 86 near the right-hand side, and a smaller opening 87 at the left-hand forward corner. Between these openings at the front side is a triangular lug 88 which approaches closely a lug or thickened portion 89 at the left-hand rear corner of the frame. The space between the lugs 88 and 89 provides a narrow opening, passageway or throat 90 connecting the slots 86 and 87, and within which the upper portion of the levers 65 and 66 are adapted to be separately disposed or loosely confined when it is desired to render them operative. The forward edge 91 of the lug 89 is adapted to operate as an actuating surface. The construction is such that by effecting a relative shifting movement between the frame 81 and the actuators 65 and 66, either actuator may be brought within the passageway 90 and thereby rendered operative, being swung forward operatively when the frame is rocked, while the other lever is left free or inoperative. Thus a rocking of the shaft 21 causes the arm 28 to swing the frame 81 pivotally about the rod 61 as a center and co-axially with the levers 65 and 66, whatever may be the position of said frame endwise of said rod.

In the present instance the relative shift or resetting between the frame 81 and the two actuators is preferably effected by shifting the frame endwise back and forth on the rod 61 so as to select the actuator to be operatively vibrated. Thus to shift or variably move the frame 81 endwise hand operated means are provided, comprising a link or arm 94 curved upward at its inner end and terminating in a forwardly bent portion which engages loosely in a slot formed in a lateral ear 95, projecting outwardly from the left-hand side portion 83 behind the pivot 61, so that the vibratory movements of the frame 81 will only slightly affect the link 94. The outer or left-hand end of the link or bar 94 is pivotally connected at 96 to the crank arm 97, fixed to and projecting downward from the rear end portion of a rock shaft 98 extending fore and aft of the machine at its left-hand side. Behind the crank arm the rock shaft bears in an angular bracket or arm 99 which is secured to the type bar segment 17. The forward end portion of the rock shaft bears in a plate 101 secured to the left-hand front post 2 of the machine. In front of the post the rock shaft is provided with a knurled button or finger piece 103. Behind the arm 99 the rock shaft has fixed to it an upstanding spring finger 104 having a head formed with holes 105, which are adapted to coöperate with a lug or projection 106 on the forward face of the arm 99, so as hold the rock shaft 98 and the connected parts, including the frame 81, in adjusted or set positions.

Indicating devices are preferably provided for facilitating the proper adjustment of the ribbon throw varying mechanism, said devices comprising suitable indicating marks or colors 107 on the front face of the plate 101. A pointer 108 is fixed to the rock shaft 98 to coöperate with these indicating marks. The middle mark 107 corresponds to the upper field *a* of the ribbon 34 and the lower mark 107 to lower or red

field *b*. When the pointer 108 is opposite the middle indicating mark the shaft 98 will be locked against further turning movement in clockwise direction by a movable stop usually provided, but which is not shown in the present instance. When the movable stop is moved to an inoperative position, this permits a further turning of the shaft 98 until the pointer 108 is brought opposite the top indicating mark 107, at which time the ribbon throw changing parts controlled by the button 103 will be adjusted so that they will be inactive at printing operations, or, otherwise expressed, will be in mimeograph position as hereinafter more fully explained.

In order positively to limit the different extents of throwing movement of the ribbon, stop devices are provided comprising a stop plate 115, which is arranged on the top of the usual spacing plate 116, secured to the upper face of the type bar segment 17. The stop plate 115 is provided with a longitudinal slot 117 which receives a headed screw 118 by which the plate is adjustably secured to its stationary support, viz., the segment 17. The rear end of the plate 115 is turned down to provide a vertical stop face proper 115ª, which is always in the path of the forward end of the part 82 of the vibratory member or frame 81 and always arrests said frame at the same point in its movement.

Assuming the parts to be adjusted as in Fig. 2, it will be understood that when a printing key is depressed, the shaft 21 will be rocked as usual and will cause the arm 28, acting on the rod or pin 33, to swing the frame 81 on its fulcrum. The upper portion of the frame moving forward will actuate the lever 66, whose upper end at this time is embraced within the passageway 90 so that the edge 91 will act to push said lever 66 forward, the lever 66 becoming in effect a part of the frame 81. At this time the lever 65 will be in the opening 86 and will be inactive, although it will swing idly forward as a result of the movement imparted to the operating lever through its connection 72 with the lever 66. As a result of this movement of the operating lever the vibrator will be lifted to interpose the printing portion or field *a* of the ribbon in the path of the actuated type bar. The parts are so proportioned and adjusted that when the front edge of the part 82 strikes the stop 115ª, thus positively arresting the vibrator and connected train of actuating devices, the upper edge portion or field *a* of the ribbon will be presented opposite the printing point. This same extent of movement will be communicated at each vibratory movement of the ribbon as long as the parts are maintained adjusted as described, so that the type depressions will follow a straight path longitudinally of, and about centrally of, the upper field *a*.

When it is desired to use the lower ribbon field *b* the finger button 103 is turned counter-clockwise, acting through the shaft 98, crank arm 97 and bar or link 94, to slide the frame 81 bodily rightward. The frame will be maintained in this new position as in the previous position by the detent devices 104, 106. As a result of this adjustment the passageway 90 will be caused to embrace the upper end of the lever 65, while the lever 66 will be located in the opening 87. Consequently, when the frame 81 is actuated during printing operations the edge 91, acting against the lever 65, will operate the same, and the motion from said levers will be transmitted through the link 71 to the operating lever 49. At the start the edge 91 will be in contact with the lever 66 but the motion of this lever at this time will be so rapid, owing to the fact that it is being pushed by the arm 50 which is being pulled by the link 71, that the lever 66 will move forward away from the edge 91. As before the movement of the parts will be arrested by the contact of the edge of the part 82 with the stop 115ª, but though the movement of the frame 81 is constant, the movement transmitted from it through the lever 65 to the vibrator will be greater than the movement transmitted through the lever 66, for the reason that the lever 65 is longer and transmits a greater movement to the link 71 than the lever 66 transmits to the link 72, and also because the link 71 acts closer to the fulcrum of the operating lever than does the link 72. The parts are so proportioned and adjusted that as a result of the longer throw transmitted to the vibrator the lower red ribbon field *b* will be presented to the types. Both in this adjustment of the parts and in the prior described adjustment of the parts, they will be restored to normal position chiefly by gravity when the printing keys are released, although the rock shaft returning spring 23 will act on the rock shaft 21 and arm 28, as well as on the universal bar, to restore the parts.

When it is desired to set the parts for mimeographing, the stop member, hereinbefore referred to and which is not shown, is lifted as described and the finger piece 103 is turned until the pointer 108 is brought opposite the top indicating mark 107. This movement of the rock shaft transmitted to the frame 81 through the described train of connections, will cause the frame to be slid bodily leftward along its fulcrum rod 61. As a result of this adjustment both levers 65 and 66 will be maintained simultaneously in the opening 86, so that at printing operations the frame 81 will be caused to swing idly on its pivot without affecting either lever 65 or 66. Therefore these levers, to-

gether with the ribbon vibrator and operating lever 49, will remain motionless in normal position so that the types may strike against the paper or work sheet on the platen without the ribbon being interposed in their path.

The ribbon controlling mechanism thus far described is the same as that employed in the Remington machine, and in order that this mechanism may be automatically controlled to bring one or another of the two printing fields *a* and *b* of the ribbon into use at a predetermined point or points in the travel of the carriage, I have provided in conjunction with said mechanism the following means:—A depending crank arm 119 is secured to the shaft 98 and is connected by a link 120 to a crank arm 121 which extends forward from an upright rock shaft 122. The arm 121 has a hub 123 which is adjustably secured to the shaft 122 by a set screw 124. This screw is received in a tapped opening in the hub and bears at its inner end against the shaft. The lower end of the shaft is received in a bearing opening in an arm 125 of a bracket 126. This bracket is secured by screws 127 to the base of the machine, only one of the screws showing in Fig. 2. From an inspection of Fig. 1 it will be seen that the hub 123 receives a bearing on the upper side of the bracket arm 125 and supports the rock shaft 122 and the parts carried thereby in position, whereas a collar 128 surrounds the shaft beneath the bracket arm and prevents the shaft from being displaced upwardly in its bearing. A set screw 129 extends through a tapped opening in the collar and bears against the shaft, and thus secures the collar thereto. The shaft extends up through an opening in the top plate 3 and through a bearing opening in an arm 130 which projects from a bracket plate 131 secured to the top plate by screws 132. The upper end of the shaft carries a controlling member which is in the nature of a crank arm 133 fixed on the shaft and extending horizontally therefrom in the general direction of the travel of the carriage. The outer end of this arm carries an upwardly projecting antifriction roller 134, carried on the arm by a shouldered pivot screw 135.

In order to automatically shift the free end of this crank arm 133, either forward or backward at a given point or points in the travel of the carriage, and thus automatically cause a change in the use of the color field employed, I provide any desired number of tappets or cams such as are shown in Figs. 4 to 7, inclusive. The tappet or cam, designated as a whole by the reference numeral 136, is shown in detail in Figs. 4 and 5. This tappet comprises a flat sheet metal body portion formed like ordinary column stops with two arms 137 that are adapted to straddle a rod or bar 138 and be received in interdental spaces 139 on opposite sides of the rod. A spring 140, such as is usually employed on column stops, may be attached to each member 136 to hold it against accidental displacement from the bar 138. Extending rearwardly from the body portion of each member 136 is an arm which is bent to form two cam faces 141 and 142 at right angles to each other and inclined to the line of travel of the tappet and, generally speaking, facing away from the body portion thereof. When a member 136 is in operative position on the bar 138, it travels with the carriage, and in the movement of the latter from right to left the cam face 142, when brought into engagement with the roller 134, will shift or cam the free end of the arm 133 rearwardly from the position shown in Fig. 2. This results in turning the shaft 122 and causing the arm 121 to be shifted in the direction of the arrow in said figure. The effect of this is to turn the shaft 98 and bring the pointer 108 opposite the lowermost or red index 107 and to shift the member 81 to the right from the position shown in Fig. 2, and effect a printing with the lowermost or red field *b* of the ribbon when the printing keys are actuated. In the movement of the carriage from left to right the cam face 141 on the member 136 will co-act with the roller 134 to shift it out of its path whenever the latter is in the path of such cam, and thus prevent these parts from obstructing the movement of the carriage.

In Figs. 6 and 7 I have shown a form of tappet or cam for moving the arm 133 in the opposite direction to automatically shift the mechanism so as to write with the black field *a* of the ribbon. This tappet is designated as a whole by the reference numeral 143 and the body thereof is constructed like that previously described so that the member may be adjusted to any point along the bar 138. The tappet 143 has a rearwardly projecting arm 144 which at its end is formed with depending cams 145 and 146, disposed at right angles to each other and in opposite direction from the cam faces 141 and 142 and, generally speaking, facing toward the body portion of the tappet. The cams 141 and 142 and the cams 145 and 146 on their respective tappets join and form an apex at their juncture. In the movement of the carriage from right to left the cam face 146 on each member 143, when brought against the rear side of the roller 134, will cam the free end of the arm 133 forwardly to the position shown in Fig. 2. This causes a corresponding movement of the parts controlled by the arm 133 to bring them into the position represented in Fig. 2 and cause the upper or black field *a* of the ribbon to be brought into use. In the return movement of the carriage the cam face 145 on

each member 143 co-acts with the roller 134 to shift it out of the path thereof and thus prevent these parts from obstructing the carriage in its return movement.

From the foregoing description it will be understood that the arm 133 is automatically shifted in one direction by a cam member 136 and is automatically shifted in the opposite direction by the cam member 143, and that said arm and the parts controlled thereby are free to, and do, remain indefinitely in either position to which they are moved, or until they are again shifted by the action of one of said cams to change the color fields from red to black, or vice versa, or until the mechanism is shifted with the aid of the hand controlled finger piece 103. It is apparent that the detent devices 104—106 tend to hold the parts against accidental displacement from either of the two color selecting positions to which they may be moved by the cams as well as by the finger piece 103.

I preferably extend the bar 138 substantially throughout the length of the carriage and provide indices thereon which correspond to those on the carriage scale 147, it being understood that the interdental spaces 139 in the bar are at letter space intervals. I prefer to mount the bar 138 directly over the usual column stop bar 148 and support it at its ends by standards 149 which are carried by the bar 148. Headed screws 150 pass through openings in the bar 138 and are threaded into the standards 149 and secure the bar to said standards. The column stop bar is in turn secured to the usual arms 151 which are fixed to and extend rearwardly from the carriage.

In carrying out my present invention I prefer to use it in connection with tabulator mechanism, so that as the carriage in carrying the work sheet from one columnar field to the next, under the control of the tabulator, may automatically control the ribbon mechanism and the characters which appear in one column, may be in black, and the characters which appear in another column may be in red, and so on.

The usual key set denominational tabulator of the No. 11 Remington machine, which I have shown in the present instance, is of a character which precludes its emmodiment with certain automatically operating ribbon color shifting mechanism heretofore devised, but by my present invention I am enabled to readily combine my mechanism to operate in conjunction with said tabulator without affecting the latter or modifying the structural features thereof.

The tabulator mechanism is not shown in its entirety, certain features thereof unnecessary for consideration in the present instance being eliminated. The eliminated parts in question relate more particularly to the means whereby the column stops are returned to normal position on the column stop bar and to the carriage releasing means. The tabulator mechanism as shown includes the column stop bar 148, hereinbefore referred to, and on which column stops 152 are mounted at letter space intervals to move fore and aft of the machine on said bar in the usual manner. The stops 152 in their inoperative positions on the bar are seated forwardly thereon, and such of them as are to be brought into use are pushed rearwardly on the bar by a key-actuated stop setting member 153. This member is in the nature of a crank arm secured to a rock shaft 154 mounted to turn in bearing openings in arms 155 which project up from the bracket plate 131 hereinbefore referred to. A second crank arm 156 projects rearwardly from the rock shaft and is connected at its rear end to a depending link 157. The lower end of this link is pivoted at 158 to a key lever 159 fulcrumed on the fulcrum bar 11 and provided at its forward end with a key 160 by which the stop setting member 153 may be actuated to project the column stop 152 in register therewith to operative position. In order to avoid confusion in the showing this stop setting mechanism has been eliminated in Fig. 3. A series of denominational stops 161 of the usual construction are formed by the upper ends of a series of levers 162 pivoted at 163 in a tabulator frame 164 fixedly secured to the main frame of the machine. The lower end of each denominational stop lever 162 is pivoted to the rear end of a link 165, the forward end of each link being pivoted to the depending arm of an associated angular lever 166. These levers turn on a pivot rod 167 which extends across the base of the machine and is secured thereto. A finger 168 at the forward end of each angular lever 166 extends through an opening in a key stem 169 provided at its upper end with a key 170. The usual carriage releasing mechanism, not shown, is operated at each actuation of a denominational key 170 to release the carriage. This mechanism is the same as that embodied in the No. 11 Remington machine and further description thereof is deemed unnecessary, it being understood, of course, that a depression of a denominational key 170 is effected to release the carriage and project the corresponding denominational stop 161 into the path of the operative column stops 152, to co-act successively therewith to arrest the carriage.

Referring particularly to Fig. 3 it will be seen that a work sheet A is shown in place in the machine. Such sheets are ordinarily divided bv vertical ruled lines *c* which separate the different columns. In setting the column stops 152 and the wipers or cams

136 and 143 the work sheet may first be introduced into the machine and the column stops set according to the different columns determined by the ruled lines *c* on the work sheet. After the column stops have been set as required the members 136 and 143 may be set in accordance with the positions of the ruled lines *c* on the sheet, and in accordance with the desire of the operator to write in either red or black in the different columns. In the present instance the columns are indicated on the sheet by the characters *d*, *e*, *f*, *g* and *h* as they appear successively on the sheet, reading from left to right. In accordance with the setting of the cams or wipers in the present instance it has been presumed that the first column *d* is to be written in black, the second *e* in red, the third *f* in black, the fourth *g* in red, and the fifth *h* in black. In practice the first column *d* is almost universally written in black. In accordance with the blank introduced into the machine, and the colors as they are to appear in the different columns as enumerated above, the operator will bring the first dividing line *c* to the printing point and observe the point on the carriage scale 147 where such division line appears. In the present instance this will appear at "60" on the carriage scale. The operator will then set a wiper 136 at "60" on the supporting bar 138, and in a like manner the position of each of the division lines separating the columns will be determined by successively moving the carriage to bring said lines *c* successively to the printing point and adjusting the wipers on the bar 138 accordingly. If, as in the present instance, the columns are to be written alternately in black and red, then the wipers will be set as represented in Fig. 3 with a wiper 136 located at the point "60" on the bar 138, this point corresponding to the position of the division line *c* between the first and second columns on the sheet. The next wiper to the right is located at "80" on the scale, and this is a wiper of the character shown in Figs. 6 and 7 for shifting from red to black. The next wiper located at "95" is a wiper 136 for shifting to red and the last wiper 143 to the right is for shifting to the black field, and so on these wipers may be arranged indefinitely according to the colors to be written in the individual columns. Just to the left of the left-hand wiper 136 is located a wiper 143, and the reason for the location of the wiper 143 at this point is to shift the parts to write black as the carriage is being returned to begin a new line and before writing is produced in the first column *d*.

In the operation of the machine the operator will proceed to write in the first column *d* in the usual manner, and the characters will appear in black. When the writing in this column is completed the operator will press the requisite denominational key 170 to bring the work sheet in the proper denominational positions to start the writing in the second column *e*. During this movement of the carriage the cam face 142 on the first of the wipers 136 will be brought into coöperation with the roller 134 and shift the arm 133 rearwardly, thus actuating the intermediate train of devices between the arm 133 and the shifting frame 81, causing the latter to be shifted to the right from the position shown in Fig. 2, and any writing which appears in the second column will be produced in red. After the work in this column is completed the operator will press the requisite denominational key 170. As the carriage is moving to bring the third column *f* to the proper position opposite the printing point, a cam face 146 on the wiper 143 situated at "80" on the bar 138 will shift the crank arm 133 forwardly and thereby move said arm and the parts controlled thereby to the position shown in Fig. 3 so that any writing within the third column will appear in black. And so on the ribbon mechanism is automatically shifted at successive operations of the tabulator mechanism to bring different columnar fields to the printing point. It will be understood that in the return movement of the carriage from left to right the arm 133 will be shifted either backward or forward by the cam faces 141 and 145 respectively, when the roller 134 is in the path of said cams. As the carriage moves to the right the wiper located at "60" on the bar 138 would leave the arm 133 and the parts controlled thereby in position to write in red, and writing would appear in red in the first column where it is intended it should appear in black. It is for this reason that one of the wipers 143 is located just to the left of the first of the wipers 136. It will be understood that immediately after the wiper 136 situated at the point "60" on the scale passes to the right of the roller 134 the cam face 146 on the wiper 143 just to the left thereof will shift the arm 133 so that any writing which appears in the first column will be written in black.

Should the operator desire to print in red in the second, third and fourth columns, for example, it is merely necessary to shift the wiper 143 situated at "80" to the dotted line position represented in Fig. 1. Said wiper would then be inoperative on the controlling member 133 and said controlling member would not be shifted until the last wiper 143 to the right reaches the roller 134. In a like manner any or all of the wipers may be shifted on the carrying bar 138 to the inoperative position. In this manner any individual wiper may be rendered inoperative or all of them may be rendered in-

operative should it be desired to throw the automatic ribbon color shifting mechanism out of operation.

Various changes may be made without departing from the spirit and scope of my invention and certain features thereof may be employed without others.

What I claim as new and desire to secure by Letters Patent, is:

1. In a typewriting machine, the combination of a carriage; shifting means for bringing one or another of two different color fields of a ribbon into use; and means operating automatically at a plurality of predetermined points in the travel of the carriage in one direction to actuate said shifting means, said automatically operating means comprising a controlling member shiftable in opposite directions and free to remain indefinitely at the limit of its movement in either direction, and means for moving said controlling member first in one direction and then in the opposite direction during the travel of the carriage in one direction.

2. In a typewriting machine, the combination of a carriage; shifting means for bringing one or another of two different color fields of a ribbon into use; and means operating automatically at a plurality of predetermined points in the travel of the carriage in one direction to actuate said shifting means, said automatically operating means comprising a controlling member shiftable in opposite directions and free to remain indefinitely at the limit of its movement in either direction, and a plurality of tappets carried by the carriage and operative successively on said controlling member to move it first in one direction and then in the opposite direction during the travel of the carriage in one direction.

3. In a typewriting machine, the combination of a carriage; shifting means for bringing one or another of two different color fields of a ribbon into use; and means operating automatically at a plurality of predetermined points in the travel of the carriage in one direction to actuate said shifting means, said automatically operating means comprising a controlling member shiftable in opposite directions and free to remain indefinitely at the limit of its movement in either direction, and cams carried by the carriage and operative successively on said controlling member during the travel of the carriage in one direction to move said controlling member first in one direction and then in the opposite direction.

4. In a typewriting machine, the combination of a carriage; shifting means for bringing one or another of two different color fields of a ribbon into use; and means operating automatically at a plurality of predetermined points in the travel of the carriage in one direction to actuate said shifting means, said automatically operating means comprising a controlling member shiftable in opposite directions and free to remain indefinitely at the limit of its movement in either direction, a plurality of tappets carried by the carriage and operative successively on said controlling member to move it first in one direction and then in the opposite direction during the travel of the carriage in one direction, and means for affording an adjustment of said tappets substantially throughout the length of the carriage.

5. In a typewriting machine, the combination of a carriage; shifting means for bringing one or another of two different color fields of a ribbon into use; and means operating automatically during the travel of the carriage to actuate said shifting means, said automatically operating means comprising a controlling member shiftable in opposite directions and free to remain indefinitely at the limit of its movement in either direction, and oppositely disposed cams coöperative successively with said controlling member during the travel of the carriage to move the controlling member first in one direction and then in the opposite direction, each cam when in coöperative relation with the controlling member being effective to move it whether the carriage be moving from right to left or from left to right.

6. In a typewriting machine, the combination of a carriage; shifting means for bringing one or another of two different color fields of a ribbon into use; and means operating automatically during the travel of the carriage to actuate said shifting means, said automatically operating means comprising a controlling member shiftable in opposite directions and free to remain indefinitely in either of the two positions to which it may be shifted, and a plurality of separate and distinct tappets one of which is operative on the controlling member only when the latter is shifted to one of said positions, another tappet being operative on said controlling member only when the latters is in the other of said positions.

7. In a typewriting machine, the combination of a carriage; shifting means for bringing one or another of two different color fields of a ribbon into use; and means operating automatically during the travel of the carriage to actuate said shifting means, said automatically operating means comprising a rock-shaft connected with said shifting means, a crank arm carried by said rock shaft, and a plurality of separate and distinct tappets one of which is operative on the crank arm to turn the rock shaft in one

direction and another of which tappets is operative on the crank arm to turn the rock shaft in the opposite direction.

8. In a typewriting machine, the combination of a carriage; shifting means for bringing one or another of two different color fields of a ribbon into use; and means operating automatically during the travel of the carriage to actuate said shifting means, said automatically operating means comprising a rock shaft connected with said shifting means, a crank arm carried by said rock shaft, a plurality of separate and distinct cams one of which is operative to cam the crank arm in one direction and rock the shaft in the same direction and another of which is operative to cam the crank arm in the opposite direction and rock the shaft correspondingly, and means for affording an adjustment of said cams to different points along the carriage.

9. In a typewriting machine, the combination of a carriage; shifting means for bringing one or another of two different color fields of a ribbon into use; and means operating automatically at a plurality of predetermined points in the travel of the carriage in one direction to actuate said shifting means, said automatically operating means comprising a controlling member shiftable in opposite directions and free to remain indefinitely at the limit of its movement in either direction, and a plurality of separate and distinct tappets, one of which is operative on the controlling member only when it is at the limit of its movement in one direction, another tappet being operative on said controlling member only when the latter is at the limit of its movement in the opposite direction.

10. In a typewriting machine, the combination with the ribbon shifting mechanism, of a traveling sheet metal tappet provided with a cam, the effective face of which is inclined to the line of travel of the tappet and co-acts with said shifting mechanism to effect an actuation thereof by a camming action thereon.

11. In a typewriting machine, the combination with the ribbon shifting mechanism, of a traveling tappet provided with two oppositely disposed cams and each of which is coöperative with said shifting mechanism for actuating it.

12. In a typewriting machine, the combination with the ribbon shifting mechanism, of a traveling tappet provided with two cams at right angles to each other and each of which is coöperative with said shifting mechanism for actuating it.

13. In a typewriting machine, the combination with a ribbon shifting mechanism, two traveling tappets, one tappet provided with a cam for actuating said shifting mechanism in one direction and the other tappet being provided with a cam for shifting said mechanism in the opposite direction.

14. In a typewriting machine, the combination with ribbon shifting mechanism, of a pair of traveling tappets, one tappet provided with two cams for actuating the shifting mechanism in one direction and the other tappet provided with two cams for actuating the shifting mechanism in the other direction.

15. A bifurcated sheet metal tappet, one leg of which is provided with a lateral extension having two integral cams arranged at substantially right angles to each other and joined to form an apex at their juncture.

Signed at Syracuse, in the county of Onondaga and State of New York this 15th day of October, A. D. 1917.

HERBERT A. CARHART.